

Abstract

The object of the invention is to solve the problems regarding the quality control of processed products (including packaged products and intermediate products during production processes) by establishing a non-destructive and non-contact type method for the measurement of gel state of a material body and a change in sol-gel state of the material body, and thereby to provide a quick automatic inspection system by which 100% inspection can be carried out easily and inexpensively on the production line.

The problem is solved by observing an image formation or speckle pattern of a light section formed on the surface or observing face of the material body, using a light scattering observation system in which a coherent light (e.g., from near infrared as a laser beam) is applied to a gel material body or a material which causes a change in sol-gel state, and its reflection or permeated scattered light is image-formed by a two-dimensional image recognizing means, and analyzing and numerically treating conditions of the image (e.g., average brightness, shape, contrast of speckles and the like) and thereby evaluating gel conditions of the material body (concentration, hardness, viscosity, coagulation deterioration, texture and the like qualities and the like), conditional (quality) change from sol to gel and conditional (quality) change from gel to sol.

The invention was completed by realizing a practically inexpensive, 100% inspection-performable, quick, non-contact and non-destructive automatic measuring system which is illustratively equipped with a laser beam irradiation source, a CCD camera or the like two-dimensional image recognizing means and a transferring means, can grasp an image or speckle pattern of a light section image-forming on the material

body surface or light intercepting device, as a two dimensional image, and can judge the qualities of said material body by analyzing the image data.